REMARKS

Claims 2-14 are currently pending in this application. Applicants hereby cancel non-elected claims 1 and 15-98 and claims 3 and 6 without acquiescence to any rejection and without prejudice to further prosecution of this subject matter in a related divisional, continuation, or continuation-in-part application. Applicants thank the Examiner for indicating that claims directed to full-length sequences or that recite sequences and hybridization conditions as taught in the specification would be favorably considered for allowance. Applicants have amended claims 2, 4, 7-8, 10-11, and 14 and added new claims 99-100 to more clearly define embodiments of Applicants' invention and to place the claims in condition for allowance. Support for the amended and new claims may be found in the specification, for example, at page 1, lines 17-19; page 2, lines 1-3; page 11, lines 1-4; page 12, lines 1-14; page 13, line 27 through page 14, line 20; page 16, lines 4-13; and SEQ ID NOs: 1-3. No new subject matter has been added.

OBJECTION TO THE CLAIMS

The PTO objects to claim 6 under 37 C.F.R. § 1.75(c), alleging that this claim is in an improper dependent form that fails to further limit the subject matter of a previous claim. In particular, claim 6 is dependent upon a non-elected claim. The PTO requires that Applicants cancel or amend the claim or rewrite it in independent form.

Applicants respectfully submit that the present amendment, which includes cancellation of claim 6 without prejudice, renders this objection moot. Applicants respectfully submit that the present claims comply with 37 C.F.R. 1.75(c) and request that the objection be withdrawn.

The PTO objects to claim 7 as being dependent upon a rejected base claim. The PTO indicates, however, that the claim would be allowable if rewritten in independent form including all limitations of the base claim.

Applicants have amended claim 7 solely to place the claim in proper independent form for allowance. Applicants therefore respectfully request that the objection to the claim be withdrawn.

REJECTION UNDER 35 U.S.C. § 112, FIRST PARAGRAPH (WRITTEN DESCRIPTION)

The PTO rejects claims 2-6 and 8-14 under 35 U.S.C. § 112, first paragraph, alleging that the claims are directed to subject matter that is not adequately described in the specification. Specifically, the PTO asserts that the specification does not disclose any function associated with fragments of 10 or 15 contiguous amino acids of SEQ ID NO:2 encoded by the claimed polynucleotides. The PTO further alleges that the specification fails to describe any identifying structural characteristics of representative species of DSP-12 other than the encoded peptide size (10 or 15 amino acids) recited in the claims. The PTO also alleges that no specific hybridization conditions are recited in claims 11-13 and that without a clear and explicit recitation of hybridization conditions, a skilled artisan could not reasonably conclude that Applicants possessed the claimed invention.

Applicants respectfully traverse this rejection and submit that Applicants possessed the claimed invention, as disclosed in the present specification and recited in the instant claims, at the time the Application was filed. Applicants submit that the rejection of claims 3 and 6 is rendered moot by the Amendment submitted herewith, which includes cancellation of these claims. The invention is directed in pertinent part to an isolated polynucleotide that encodes a polypeptide comprising the sequence set forth in SEQ ID NO:2; to an isolated polynucleotide as recited that detectably hybridizes to the complement of the sequence recited in SEQ ID NO:1 under moderately stringent conditions; to an expression vector comprising such polynucleotides; and to a host cell comprising such an expression vector.

The specification provides a detailed description of relevant and identifying characteristics of the claimed genus that reasonably conveys to a person skilled in the art that Applicants possessed more than a single representative species. The instant Application

make and use the claimed polynucleotide. The specification also describes that a DSP-12 polynucleotide may encode a DSP-12 polypeptide variant capable of dephosphorylating an activated MAP-kinase, wherein the polynucleotide comprises a sequence at least 90% identical to a polynucleotide that encodes a polypeptide comprising an amino acid sequence set forth in SEQ ID NO:2 (*see, e.g.,* page 10, lines 7-16; page 12, lines 1-14; page 13, line 27 through page 14, line 6). The specification further describes structural features that correlate with functional activity. Dual specificity phosphatases belong to the family of protein tyrosine phosphatases that share a conserved catalytic domain containing a cysteine residue situated N-terminal to a stretch of five variable amino acids followed by an arginine residue (*see, e.g.,* page 38, lines 7-12, and references therein). Within the DSP-12 polypeptide sequence (SEQ ID NO:2) encoded by the claimed polynucleotides is the active site domain comprising the sequence CLVHCKMGVSRSASTVIAYAM (SEQ ID NO:3) located at positions 249-269 of SEQ ID NO:2 (*see, e.g.,* page 12, lines 5-7; page 16, lines 4-7; SEQ ID NO:2).

With respect to claims 11-13, as is well known in the art, the ability of a polynucleotide to hybridize to a complementary nucleic acid molecule depends on the chemical properties of the nucleic acids involved, which are determined by the nucleotide sequences of such molecules. Applicants therefore submit that disclosure of the complete chemical structure of a polynucleotide (SEQ ID NO:1) encoding a DSP-12 polypeptide (SEQ ID NO:2), or variant thereof, (*see, e.g.,* page 14, lines 12-20) provides sufficiently detailed and relevant identifying characteristics of the claimed polynucleotide. A polynucleotide variant of a DSP-12-encoding polynucleotide includes a polynucleotide that exhibits at least 90% nucleotide identity to a polynucleotide comprising the sequence set forth in SEQ ID NO:1 (*see, e.g.,* page 14, lines 3-5). The instant specification also discloses that such a polynucleotide variant is substantially homologous to a naturally occurring DNA or RNA that encodes a native DSP-12 polypeptide and is capable of hybridizing to a disclosed DSP-12-encoding sequence, such as SEQ ID NO:1, under moderately stringent conditions (*e.g.,* page 14, lines 12-26). Additional stringency is provided by a wash in 0.1X SSC and 0.1% SDS at 50 °C for 15 minutes (*e.g.,* page 14, lines 19-

encoding polynucleotide under moderately stringent conditions that include a wash in 0.1X SSC and 0.1% SDS at 50 °C for 15 minutes describes characteristics that distinguish the claimed polynucleotide. Exemplary suitable moderately stringent conditions are described in the specification (*e.g.*, page 14, lines 15-20) and are known in the art. Therefore, the instant specification reasonably conveys sufficient, detailed, and relevant characteristics of species within the claimed genus of polynucleotides.

Accordingly, Applicants respectfully submit that the presently claimed subject matter is adequately described by the specification such that a person skilled in the art would recognize that Applicants possessed the claimed invention at the time the Application was filed. Applicants therefore submit that the instant Application complies with the written description requirement under 35 U.S.C. § 112, first paragraph, and respectfully request that the rejection be withdrawn.

REJECTION UNDER 35 U.S.C. § 112, FIRST PARAGRAPH (ENABLEMENT)

The PTO rejects claims 2-6 and 8-14 under 35 U.S.C. § 112, first paragraph, for lack of enablement. The PTO asserts that the specification does not provide sufficient guidance to enable a person skilled in the art to make and use the claimed invention in a manner that is reasonably correlated with the scope of the claims. More specifically, the PTO alleges that the specification does not provide sufficient guidance with respect to modifications that could be made to the claimed polynucleotides and that would not affect the function of the encoded phosphatase. The PTO further alleges that the hybridization conditions set forth in claims 11-13 are insufficiently defined.

Applicants respectfully traverse this rejection and submit that, as disclosed in the specification and recited in the instant claims, Applicants fully enabled the claimed invention at the time the instant Application was filed. As noted above, Applicants' invention is directed in pertinent part to an isolated polynucleotide that encodes a DSP-12 polypeptide, or a variant thereof, and to related compositions and methods. Also as noted above, the present Amendment

Applicants submit that the instant disclosure provides enabling guidance for a person skilled in the art to make and use the claimed polynucleotides encoding a DSP-12 polypeptide readily and without undue experimentation. The specification discloses the polynucleotide sequence (SEQ ID NO:1) that encodes a DSP-12 polypeptide (SEQ ID NO:2) which is capable of dephosphorylating a DSP-12 substrate, for example, an activated MAP-kinase (*see, e.g.,* page 9, line 26 through page 10, line 3). The specification further describes how to make and use an isolated polynucleotide that encodes a DSP-12 polypeptide variant capable of dephosphorylating an activated MAP-kinase, wherein the polynucleotide comprises a sequence at least 90% identical to a polynucleotide that encodes a polypeptide comprising an amino acid sequence set forth in SEQ ID NO:2 (*e.g.,* page 14, lines 3-6). By using computer algorithms well known in the art and disclosed in the specification, such as Align or the BLAST algorithm, a person skilled in the art can determine the percent identity of a polynucleotide to the disclosed DSP-12 polynucleotide sequence (*see, e.g.,* page 13, line 27 through page 14, line 11). For determining that a polynucleotide encodes a recited polypeptide that retains the ability to dephosphorylate an activated MAP-kinase, the specification explicitly teaches that the DSP-12 active site domain comprises the sequence CLVHCKMGVSRSASTVIAYAM (SEQ ID NO:3) located at positions 249-269 of SEQ ID NO:2 (*see, e.g.,* page 12, lines 5-7; page 16, lines 4-7; SEQ ID NO:2). The specification also describes the relationship between wild-type aspartate at position 222 of SEQ ID NO:2 and DSP-12 catalytic activity, for example, through the use of substrate trapping mutants of DSP-12 (*see, e.g.,* page 10, line 16 through page 11, line 15). Thus, it is clear that given the DSP-12 polynucleotide sequence and the locations within the encoded DSP-12 polypeptide sequence of the amino acids comprising the catalytic active site, a skilled artisan, using alignment methods as discussed above, would be able to identify readily and routinely whether a polynucleotide will encode a catalytically active DSP-12 polypeptide.

Furthermore, a person skilled in the art would be able to identify or make a DSP-12 polypeptide, or a variant thereof that retains the ability to dephosphorylate a DSP-12 substrate, according to methods known in the art and disclosed in the specification without undue

13, line 3; page 19, lines 7-15; *see also* pages 25-28). The polypeptide produced can then be routinely analyzed for its ability to dephosphorylate a suitable substrate such as an activated MAP-kinase, according to assays for detecting DSP-12 activity, which are also described in the specification (*see, e.g.*, pages 21-22). Applicants respectfully submit that given the teachings of the present specification and, *inter alia*, the level of skill in the art, performing such assays to determine whether an encoded DSP-12 polypeptide has MAP-kinase phosphatase activity would not amount to undue experimentation, but instead is merely a matter of permissible routine screening. (*In re Wands*, 858 F.2d 731, 736, 8 U.S.P.Q.2d 1400 (Fed. Cir. 1988) ("Enablement is not precluded by the necessity for some experimentation such as routine screening.").

Applicants further submit that a skilled artisan could readily and without undue experimentation make and use an antisense polynucleotide comprising a sequence that is complementary to a polynucleotide encoding a DSP-12 polypeptide as recited in the instant claims. According to methods known in the art and described in the present specification, by using the polynucleotide sequence set forth in SEQ ID NO:1, a person skilled in the art would readily be able to design and make an antisense polynucleotide that binds in a sequence-specific manner to a DSP-12 polynucleotide or a variant thereof, for example, to prevent transcription of a DSP-12 polynucleotide or translation of a DSP-12 polypeptide (*see, e.g.*, page 12, line 30 through page 14, line 5).

Additionally, and particularly with regard to claims 11-13, Applicants submit that given the teachings of the present specification and the state of the art, a person skilled in the art is enabled to make and use the recited isolated polynucleotide that detectably hybridizes to a polynucleotide having a sequence complementary to a sequence set forth in SEQ ID NO:1, under the recited conditions, wherein the isolated polynucleotide has at least 90% nucleotide identity to a polynucleotide comprising the sequence set forth in SEQ ID NO:1, and wherein the isolated polynucleotide encodes a polypeptide capable of dephosphorylating an activated MAP-kinase. As disclosed in the specification and as known to the art, suitable moderately stringent hybridization conditions may include the addition of the recited wash step in a hybridization

or more of time, temperature, and concentration of solution components that are used for prehybridization, hybridization, and wash steps. Applicants submit that selection of suitably stringent conditions for hybridization by a person skilled in the art does not require undue experimentation but is a matter of permissible routine screening.

In view of the above remarks and the present Amendments, Applicants submit that the specification also enables a person skilled in the art to make and use related compositions, such as the expression vector of claims 4, 8, and 12 and the host cell of claims 5, 9, and 13 (*see, e.g.*, page 19, line 7 through page 21, line 16). The specification further discloses, in detail, methods for producing and detecting expression of a DSP-12 polypeptide (*see, e.g.*, page 12, line 20 through page 13, line 3; page 21, lines 9-16; page 25, line 1 through page 27, line 16). On the basis of the disclosure in the specification and methods well known in the molecular biology art, persons skilled in the art would be able to make and use the aforementioned compositions and methods readily and without undue experimentation.

Applicants therefore respectfully submit that the present Application satisfies all requirements under 35 U.S.C. § 112, first paragraph, and request that the rejection of the instant claims be withdrawn.

REJECTION UNDER 35 U.S.C. § 112, SECOND PARAGRAPH

The PTO rejects claims 6-10 and 14 under 35 U.S.C. § 112, second paragraph, for indefiniteness. More specifically, the PTO asserts that recitation of uncommon abbreviations such as DSP-12 and MAP-kinase renders the claims indefinite. The PTO rejects claims 7-10 for allegedly failing to correct the defect present in the base claim.

Applicants respectfully submit that in view of the Amendments submitted herewith, which include cancellation of claim 6, the rejection of claim 6 and claims 7-10 that depend from claim 6 is rendered moot. Applicants also submit that in view of the submitted Amendments, the basis for rejection of claim 14 is obviated. Claim 14 as amended is directed to a method for producing a dual specificity phosphatase-12 (DSP-12) polypeptide comprising the

Applicants respectfully submit that the present claims particularly point out and clearly define what Applicants regard as their invention as required under 35 U.S.C. § 112, second paragraph. Accordingly, Applicants request that the rejection of these claims be withdrawn.

REJECTION UNDER 35 U.S.C. § 102

The PTO rejects claims 2-3 and 10 under 35 U.S.C. § 102(a), as being anticipated by Accession No. AL121363 or AL121364 (each created September 25, 1999). In particular, the PTO alleges that AL121363 discloses a nucleotide sequence (nucleotides 1-339) that share 100% identity with SEQ ID NO:1 (nucleotides 911-1249). The PTO also alleges that AL121364 discloses a nucleotide sequence (beginning at nucleotide position 550) that is identical to SEQ ID NO:1 at nucleotide positions 1320-1865. The PTO further asserts that the fragments disclosed in the cited documents range from about 340-540 contiguous nucleotides and would inherently encode 110-180 contiguous amino acids.

Applicants respectfully traverse this rejection and submit that the cited documents fail to anticipate the instant claims as amended herewith. Applicants submit that the rejection of claim 3 as allegedly anticipated by AL121363 or AL121364 is rendered moot by the Amendment submitted herewith, which, as noted above, includes cancellation of this claim.

Applicants respectfully submit that both AL121363 and AL121364 fail to anticipate each and every limitation of the instant claims and, therefore, cannot be regarded as novelty destroying. The cited documents fail to teach or suggest an isolated polynucleotide that encodes a polypeptide comprising an amino acid sequence set forth in SEQ ID NO:2. The cited documents also fail to teach or suggest an antisense polynucleotide comprising a polynucleotide that is complementary to SEQ ID NO:1 or to a polynucleotide that encodes a polypeptide capable of dephosphorylating an activated MAP-kinase, wherein the polynucleotide comprises a sequence at least 90% identical to a polynucleotide that encodes a polypeptide comprising a sequence set forth in SEQ ID NO:2. Each of the EST sequences disclosed in the cited

encodes the active site domain (SEQ ID NO:3) of the DSP-12 polypeptide sequence; therefore, if either EST sequence could be used for expression of a polypeptide, the polypeptide lacking the active site domain (SEQ ID NO:3) would not be capable of dephosphorylating an activated MAP-kinase.

Applicants respectfully submit that the subject matter of the present claims is novel, and thus the claimed invention complies with the requirements of 35 U.S.C. § 102. Applicants therefore respectfully request that these rejections be withdrawn.

Applicants respectfully submit that all claims remaining in the Application are now allowable. Favorable consideration and a Notice of Allowance are earnestly solicited.

Respectfully submitted,

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